

	XML Schema1	Int	Float	XML Schema2	String
	Column 1	Column 2	Column 3	Column 4	Column 5
Row 1	XML Instance 1	1	0.1746	XML Instance a	"storage"
Row 2	XML Instance 2	7	0.23232	XML Instance b	"of"
Row 3	XML Instance 3	3	0.14159	XML Instance c	"strings"

A RELATIONAL DATABASE STORING XML INSTANCES

FIGURE 1 - Prior Art

<i>namespace URI</i>	201
"http://www.microsoft.com/xquery"	210
""	220
"foo"	230

SQL XML Schema Collection Identifier DB.RelSch.foo

FIGURE 2

301310

CREATE XML SCHEMA COLLECTION <SqlID> AS <expression> [<expression>...]

FIGURE 3

402

1. **CREATE XML SCHEMA COLLECTION msSqlID1 AS**

'<scheman XMLns="http://www.w3.org/2000/10/XMLSchema" targetNamespace="http://www.w3.org/namespace/"> 401

<element name="TOP">

<complexType>

<attribute name="name" type="string" use="required" />

<attribute name="value" use="default" value="no">

<simpleType>

<restriction base="string">

<enumeration value="yes" />

<enumeration value="no" />

</restriction>

</simpleType>

</attribute>

</complexType>

</element>

</schema>'

403  
Schema  
Components

**FIGURE 4**

```
<include
  id = ID
  schemaLocation = anyURI
  {any attributes with non-schema
namespace . . .}>
  Content: (annotation?)
</include>
```

501

## FIGURE 5

```
<redefine
  id = ID
  schemaLocation = anyURI
  {any attributes with non-schema namespace . . .}>
  Content: (annotation | (simpleType | complexType | group |
attributeGroup))*
</redefine>
```

## FIGURE 6

```
<import
  id = ID
  namespace = anyURI
  schemaLocation = anyURI
  {any attributes with non-schema namespace . . .}>
  Content: (annotation?)
</import>
```

701

## FIGURE 7

810

```

1. ALTER XML SCHEMA COLLECTION msSqlID1 ADD '<scheman xmlns="http://www.w3.org/
2000/10/XMLSchema"
targetNamespace= "http://www.w3.org/namespace/">
<element name="BOTTOM">
<complexType>
<attribute name="name" type="string" use="required" />
<attribute name="value" use="default" value="no">
<simpleType>
<restriction base="string">
<enumeration value="yes" />
<enumeration value="no" />
</restriction>
</simpleType>
</attribute>
</complexType>
</element>
</schema>'

```

820

802

801

FIGURE 8

ALTER TABLE <table\_name>  
ALTER COLUMN <column\_name> XML [(<SqlID>)] [NULL | NOT NULL]

910 901 920

**FIGURE 9**

ALTER TABLE products  
ALTER COLUMN manufacturing\_steps XML (msSqlID1) NOT NULL

1010 1020 1001

**FIGURE 10**

ALTER TABLE products  
ALTER COLUMN manufacturing\_steps XML NULL

1110 1101

**FIGURE 11**

```
DROP INDEX xml_index ON products
ALTER TABLE products
ALTER COLUMN manifest (msSqlID2) XML -- this retypes the column
CREATE XML INDEX xml_index ON products (manifest)
```

1220 points to `DROP INDEX`  
1210 points to `xml_index`  
1230 points to `ALTER COLUMN`  
1201 points to `CREATE XML INDEX`

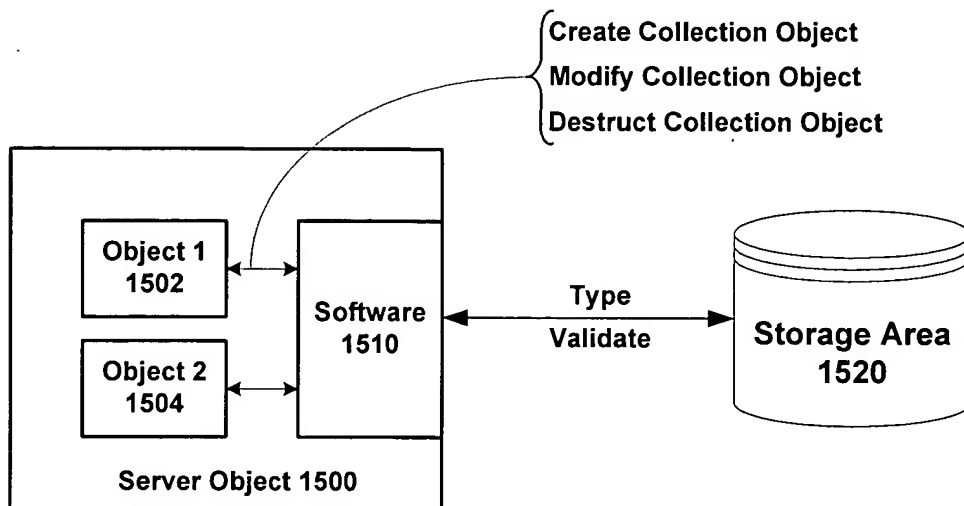
**FIGURE 12**

1. xml = <http://www.w3.org/XML/1998/namespace>
2. xs = <http://www.w3.org/2001/XMLSchema>
3. xsi = <http://www.w3.org/2001/XMLSchema-instance>
4. fn = <http://www.w3.org/2002/11/xquery-functions>
5. xdt = <http://www.w3.org/2003/02/xquery-datatypes>

**FIGURE 13**

```
sql = urn:schemas-microsoft-com:xml-sql
sqltypes = http://schemas.microsoft.com/sql/2002/types
```

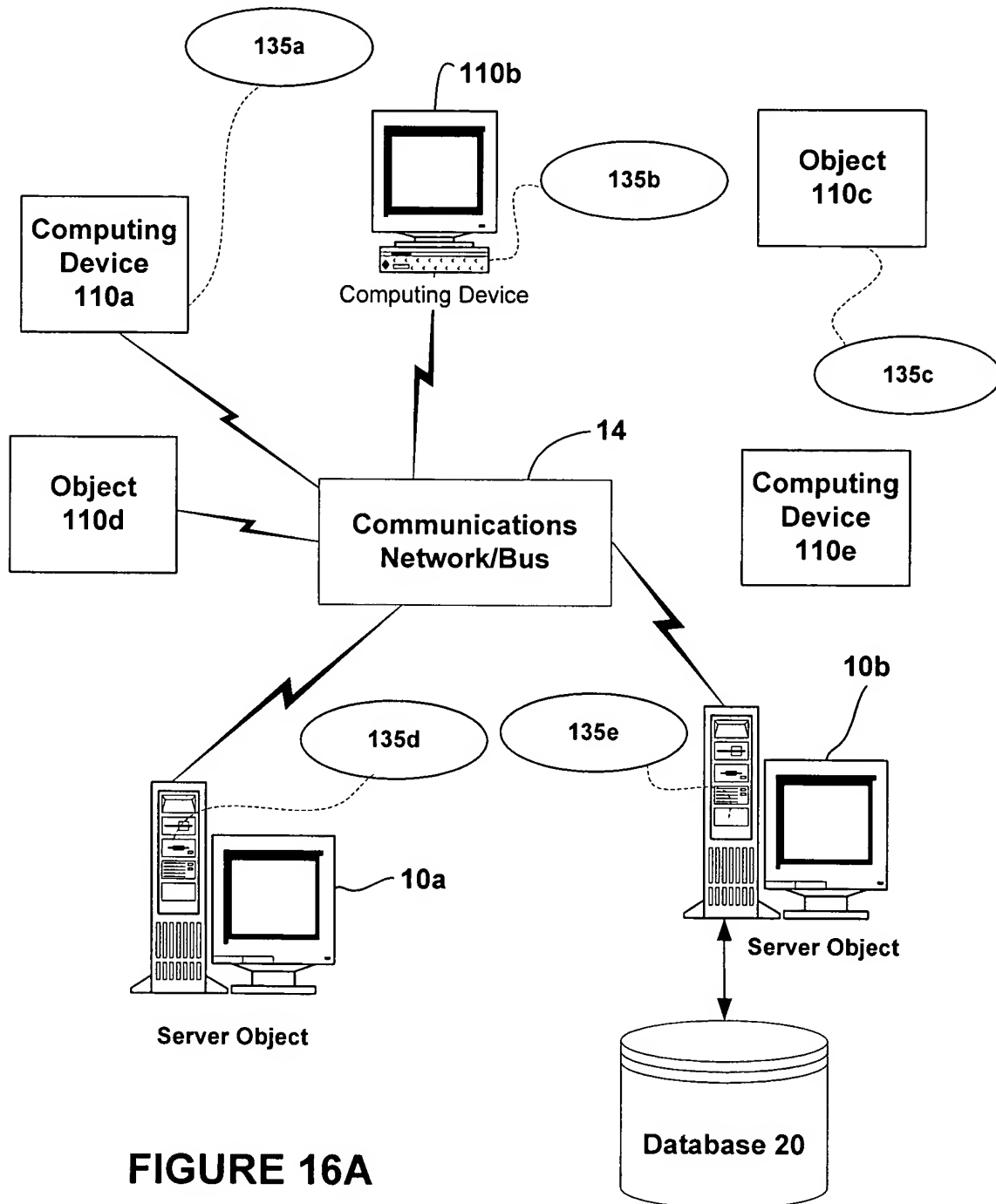
**FIGURE 14**



**FIGURE 15A**

	XML Schema Collection Object	XML Schema1		XML Schema2	
		Int	Float	XML Schema2	String
	Column 1	Column 2	Column 3	Column 4	Column 5
Row 1	XML Instance 1	1	0.1746	XML Instance a	"storage"
Row 2	XML Instance b	7	0.23232	XML Instance b	"of"
Row 3	XML Instance c	3	0.14159	XML Instance c	"strings"

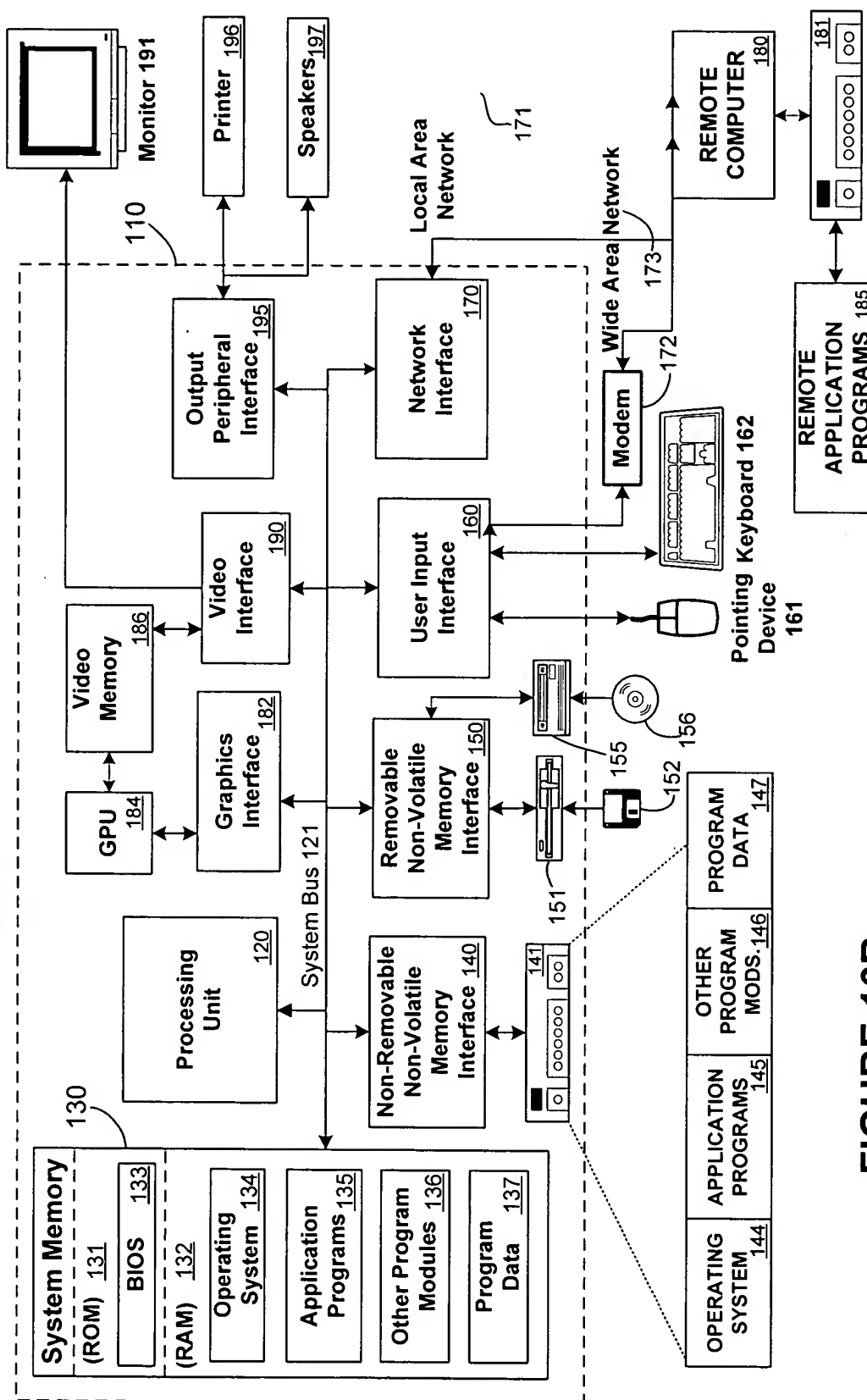
**FIGURE 15B**



**FIGURE 16A**

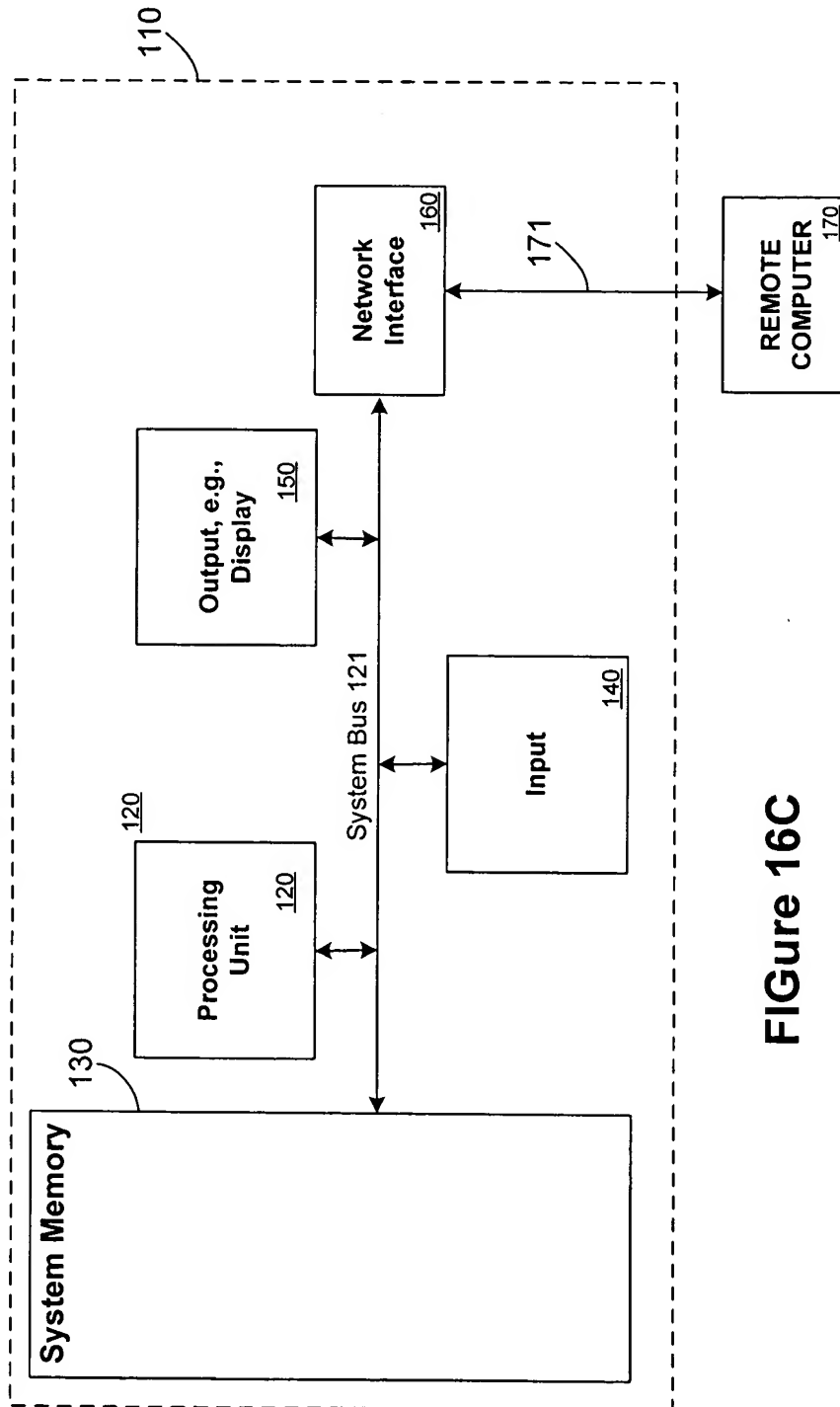


# Computing Environment 100



**FIGURE 16B**

Computing Environment 100



**FIGURE 16C**